Mercedes Benz Conductor Plate

The Mercedes-Benz 5G-TRONIC, also known as 722.6, is an electronically shifted, 5 speed overdrive automatic transmission that was first introduced in 1996. It has been used by a number of vehicle manufacturers including Mercedes-Benz, Chrysler, Jaguar, Jeep, Dodge, and SsangYong.

This transmission uses only three planetary gear sets and the computer can command five forward speeds and two ratios for reverse.

The sophistication lies in the hydraulic and electronic control. Transmission operation is achieved through the control of six solenoids which are situated on a conductor plate. This is attached to the valve body inside the transmission.

The hydraulic valve body controls and directs fluid pressure to the torque converter lock-up clutch, three holding clutches, and three driving clutches which allow for the smooth up and downshift of the transmission.

Input information comes from two speed sensors, neither of which measures the input shaft (turbine) speed directly. Turbine speed is calculated from both sensors depending on the gear selected. The speed sensors are also part of the conductor plate. Engine, speed, throttle, and accelerator position are provided by the engine control module and vehicle speed is provided by the wheel speed sensors via the brake control module. This is done by CAN-BUS:

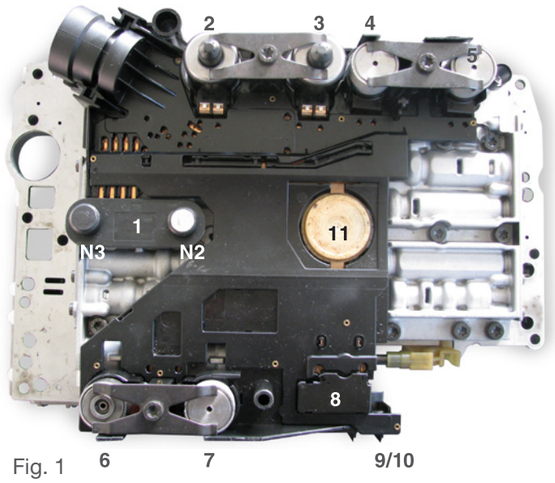

Fig. 1

using this allows for an integrated system such as inhibiting gear changes during hard cornering. The transmission control module monitors the sensors for plausibility and the solenoids for command and effect. By comparing engine speed and input shaft speed, it can monitor torque converter slip. By monitoring input shaft speed, and wheel speed, it can monitor gear ratio, clutch slip and account for tyre wear.

By comparing actual values with the model programmed into the TCM, it can adapt for wear in the clutches by modulating shift pressure.

The conductor plate (febi no. 32342) carries the electrical sensing and control for the internals of the transmission. (Fig. 1)

1. N2 and N3 are two Hall Effect speed sensors, monitoring the speed of two separate rotating members and providing input shaft speed
2. Line pressure modulating solenoid – controlled by pulse width modulation on the earth side
3. Shift pressure modulating solenoid – controlled by pulse width modulation on the earth side
4. 1-2/4-5 12v gear shift solenoids, which are earth switched by the TCM
5. 3-4 12v gear shift solenoid, which is earth switched by the TCM
6. Torque converter lock-up clutch pressure control solenoid – controlled by pulse width modulation on the earth side
7. 2-3 12v gear shift solenoid, which is earth switched by the TCM
8. Reed switch – closed by a magnet in a plunger and moved by the selector. The reed switch is in series with the temperature sensor for the purpose of indicating the „park“ and „neutral“ positions to inhibit the starting of the vehicle with a gear engaged
9. PTC temperature sensor thermistor providing transmission oil temperature
10. Transmission fluid level sensor
11. Float-ATF expansion plug

Replacing the Conductor Plate

When replacing a conductor plate, cleanliness is paramount when dealing with an automatic transmission. Any material entering the valve block may inhibit movement of the spool valves. Only use lint-free cloths. All bolts and fixings must be tightened to the manufacturer‘s torque specifications.

The following parts are required:

Part Number	
1 x 32342	Conductor plate
1 x 36332	Electrical plug
1 x 10072	Gasket
1 x 09463	Oil strainer
5 x 29449	1ltr ATF
1 x 38023	Dipstick
1 x 44204	Locking pin

Disassembly

Drain the automatic transmission fluid; this is best done when the transmission is warm. Undo the drain plug and drain the ATF into a clean receptacle. This will allow you to measure the quantity and to check the fluid‘s condition and for debris.

Allow the transmission to cool to an ambient temperature before proceeding with the dismantling process.

Remove the cover on the harness plug by inserting a small flat bladed screwdriver into the hole and carefully screw it out.

Turn the lug on the tan collar anti-clockwise – it will click and then jack-out the harness plug. (Fig. 2)

In the centre of the plug is a 7mm bolt. Undo the bolt and then prise out the guide sleeve. Refit the sump drain plug. Identify and remove the 10 torx screws holding the valve body to the transmission. Remove the valve body, paying close attention to the inhibitor plunger. (Fig. 3)

Inspect the drained transmission fluid. Darkening of the ATF and the smell of burning indicate heavy clutch wear/slip. If the ATF has turned a pink colour or if there is frothing, this could indicate cross contamination with the coolant. If any of these conditions are encountered, further investigation and repair is required.

There is likely to be a fine, dark grey film in the sump pan which is perfectly normal. Inspect the sump magnet for metal pieces which is an indication of more serious damage.

Fig. 2

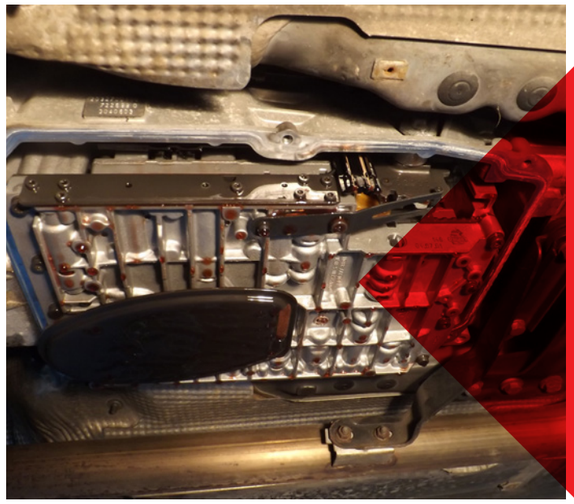

Fig. 3

Mercedes Benz Conductor Plate

Reassembly

Work on a clean and prepared surface.

With the valve body removed, remove the plastic solenoid covers from the valve body conductor plate and the 3 bolts holding the leaf springs. The solenoids can now be carefully removed.

Remove the conductor plate from the valve body. While the pressure modulating solenoids have two O-rings, the shift solenoids do not have any. Inspect the O-rings and the ports into which they fit. Inspect the port filters for debris. (Fig. 4)

Fig. 4

Fig. 5

Position the new conductor plate onto the valve body; there are two locating tabs that will snap into position. Lubricate the O-rings and push the solenoids into their ports all while aligning the contacts. Refit the leaf springs and bolts and tighten. Then, refit the plastic solenoid covers.

Back on the vehicle, wipe the surface of the mating face of the valve body with a lint-free cloth. Refit the valve body, locating the selector plunger on the selector sector, and tighten the valve body retaining bolts. Lubricate the new filter O-ring and fit the new oil strainer, making sure the barbs on the filter fit into the slot in the valve body. Lubricate and fit the new sump pan gasket and fit the sump pan to the transmission.

The conductor plate is connected to the outside of the transmission by a guide bush, which is sealed inside the conductor plate and the transmission casing by O-rings. A failure of these rings allows oil to enter the harness plug. Metal contaminants suspended in the ATF can cause short circuits. (Fig. 5)

Lubricate the guide bush O-rings and align the holes in the guide bush with the pins in the conductor plate. Push into place.

Refit the harness plug, turning the tan collar clockwise until you feel resistance. Then, turn it a further 30° until you feel it click into its locked position. Measure the ATF you have drained to get an idea of how much was removed. Approximately five litres will be required.

Remove the red locking pin on the transmission filler tube and remove the plug. Replenish the oil through the dipstick/filler tube using a clean funnel or filler pipe. Fill with just less than the quantity you have removed.

Start the engine and let it idle for 2 minutes. Move the selector lever through the different positions resting for 10 seconds in each position. This will fill the clutches and expunge any air.

Very few 722.6 applications are fitted with an ATF fluid level dipstick. A dipstick will be required to measure the oil level if required (febi no. 38023).

The dipstick is around one metre long and is pushed into the transmission dipstick tube until it touches the bottom of the sump pan. A portion of the dipstick will stick out of the filler tube.

The transmission fluid has a very high rate of volumetric thermal expansion. As a result, there are two marks on the dipstick – a lower mark for measuring at 25 °C and a higher mark for measuring at 80 °C. With the engine warm, use a diagnostic tool to check the transmission temperature. The transmission must be in ‘D’ or ‘R’ to close the reed switch in the transmission fluid temperature sensor. In other positions, the value defaults to coolant temperature. (Fig. 6)

Take a measurement with the engine at idle and with the fluid temperature at 80 °C.

Add fluid until it reaches the upper level. Then, replace the filler plug and perform a road test for the vehicle to check for correct operation.

Fig. 6

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